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INTERNATIONAL GEOPHYSICAL COOPERATION PROGRAM -- SOVIET-BLOC ACTIVITIES

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I. GENERAL

Sector of Geography, Academy of Sciences Kazakh SSR

The Sector of Geography of the Academy of Sciences Kazakh SSR marked the 20th year of its organization in January 1959. The sector was created on the initiative of P. V. Simonov, geographer, and through his efforts all the noted geographers of Alma-Ata were drawn into its work. The staff, during its first year, consisted of 14 members.

The work of the sector expanded considerably in the postwar years and, in particular, during the last 3 years. It includes the investigation of glaciers, lakes, landscapes, and natural regions and also the economic-geographic study of the oblasts and economic regions.

Particularly great successes were achieved by Kazakhstan glaciologists. The work of Academician N. N. Pal'gov of the Academy of Sciences Kazakh SSR on the investigation of glaciers received wide attention by Soviet and foreign glaciologists. The inclusion of the academy's glaciologists in the work of the IGY serves as an indication of the high level of their successes. The material of the investigations of the sector's Zailiyskiy Glacier Expedition are subject to international exchange.

In connection with the preparations for and the conduct of the IGY the sector's staff of geography was increased from 13-14 men to 43 associates in 1958.

The growth of the staff, the wide expansion of duties, and the heavy increase in demands for its services require the reorganization of the Sector of Geography, Academy of Sciences Kazakh SSR into an Institute of Geography. ("Twenty Years of the Sector of Geography of the Academy of Sciences Kazakh SSR," by Ye. N. Gladysheva; Alma Ata, Vestnik Akademii Nauk Kazakhskoy SSR, No 2, Feb 59, pp 119-120)

II. ROCKETS AND ARTIFICIAL EARTH SATELLITES

Nesmeyanov Sees Moon Conquest Under 7-Year Plan

A. N. Nesmeyanov, president of the Academy of Sciences USSR, in his opening address at the Regular Annual Meeting of the Academy in Moscow, said, ... "There is no doubt that during the Seven Year Plan such grandiose problems as the attainment and study of the moon and then the nearest planets will also be realized." (Annual Meeting of the Academy of Sciences USSR," Moscow, Izvestiya, 27 Mar 59)

III. UPPER ATMOSPHERE

Discovery of Galactic or Blue Star Clusters Reported by Ambartsumyan

A new type of star cluster, galactic, was discovered by associates of the Byurakan Astrophysical Observatory under the supervision of Academician V. Ambartsumyan, president of the Academy of Sciences Armenian SSR. These galaxies are called nonstationary, or blue, by Ambartsumyan. A considerable portion of their mass consists of gas from which it is obvious the new heavenly bodies are formed. The nonstationary galaxies are in a state of origination. The physical processes in them occur infinitely more intensely than in all of the star systems known up to now. This is an indisputable indication of the fact of the continuous origin of star worlds and of the perpetual youthfulness of the universe.

Academician Ambartsumyan first discovered clusters of young stars, stellar associations, in our galaxy which differed sharply from all other star clusters. This was one of the greatest discoveries of the last 10 years and showed that the process of the formation of stars in the galaxy continues at present.

The study of nonstationary galaxies and their clusters, in Academician Ambartsumyan's opinion, will make it possible to discover completely new physical phenomena and properties of matter. Precisely these regions of the universe are obviously the sources of heavy cosmic radiations. ("Blue Galaxies"; Moscow, Izvestiya, 8 Apr 59, p 6)

Kozyrev Describes Observance of Lunar Eruption

The discovery of volcanic activity on the Moon was announced in the Soviet Union last November. The claim was based on the results of a spectroscopic study of the crater of Alphonsus by the N. A. Kozyrev, an astronomer at the Main Astronomical Observatory at Pulkovo. While some information on these observations has been given in the Soviet press, a first-hand account of these investigations has only now been published in Priroda. A full translation of Kozyrev's article is given here.

"The study of the morphology of the Moon's surface conclusively shows that the Moon's relief gradually developed as a result of repeated upheavals and subsidences of its crust. Actually, the accumulated and "semisubmerged" craters occurring on the edges of the seas show that in these spots there occurred a subsidence of parts of the crust with the formation of cracks and the subsequent outpouring of a molten mass. The famous valley in the Lunar Alps, with a width of about 10-15 kilometers and a length of over 100 kilometers, with sheer rims resembling one another, is an example of the upheaval of the lunar crust accompanied by considerable stretching. Volcanic activity must undoubtedly be connected with such tectonic processes.

We can imagine the discharge of molten masses from the bowels of the Moon onto its surface. With the absence of atmosphere, the gasses adsorbed in the fusions must escape from them violently, creating foamy structures. As a result, the upper layers of rock on the Moon must be extremely porous with a negligible coefficient of heat conductivity. It is probable that the coefficient of heat conductivity of the upper layers of the Moon is 1/100th or 1/1,000th of the coefficient of heat conductivity in the upper layers of the Earth. If the discharges of molten masses, i.e., magma, occurred in separate parts of the lunar surface and in different epochs, then the gases emitted in this manner could not create a noticeable atmosphere near the moon. Actually the constant bombardment of the moon's surface by solar corpuscles, the hard radiation of the Sun, and micrometeorites must impart to the particles of the atmosphere a velocity exceeding the parabolic velocity (about 2-4 kilometers per second) to blow it off and not accumulate it. It is a different matter if the planet has an ample atmosphere. Then the penetration of particles will be similar to deep-seated explosions communicating energy to large masses through which the separate particles of gas obtain low velocities which cannot lead to the dissipation of the planetary atmosphere. That is why, if there was no adequate atmosphere near the Moon in the beginning, then it could not have acquired it gradually.

The reason for tectonic processes and the internal energy of cosmic bodies up to now was not known. In any case, it is clear that a large body with equal coefficients of heat conductivity has a greater possibility of retaining and accumulating internal energy than a small body. It would appear that these considerations speak against the possibility of the retention by the Moon of a capability for tectonic processes at present. However, if we keep in mind the extremely low heat conductivity of the Moon's surface layers, then we arrive at the conclusion that it can accumulate and preserve internal energy better than our Earth. Therefore, orogenetic processes can and are now going on the Moon, and even more intensively than on the Earth. An interesting and somewhat paradoxical conclusion was obtained: the absence of atmosphere which caused the porous structure of the surface, sharply diminishing heat transfer, causes an accumulation of internal energy and the development of orogenic processes.

The Moon's topography has been studied very carefully during the course of 200 years. Despite this, it is not possible to cite one proven example of a change in the lunar relief up to the most recent time. This result is not in contradiction with the conclusion concerning the possibility of intensive tectonic activity on the Moon at present. In fact, if we disregard the processes connected with the activity of water, air, and life on Earth then, then from the Moon, it would be very difficult with certainty to establish the presence of orogenic processes on Earth.

However, for a long time, many observers implied the possibility of changes in certain craters on the Moon. Among observations of this kind, indications on the appearance of haze veiling the details of the bottoms of craters are especially interesting. To our regret these observations were visual and insufficiently conclusive, as the visibility of details on the Moon depends very much on the conditions of illumination of the Sun and besides this may be connected with the quality of the images, i.e., with the state of the Earth's atmosphere.

The first serious and objective basis for the possibility of the appearance of smoke obscuring the details of the lunar surface were obtained by Dinsmore Alter, an astronomer, in October 1956 on the 60-inch reflector at Mount Wilson Observatory in California. He obtained a series of pictures of the craters of Ptolemy, Alphonsus, and Arzachel in the blue and infrared rays.

Because of the scattering of light by the Earth's atmosphere, all the pictures in the blue rays had considerably less contrast than those in the infrared. But details of the bottom of Alphonsus crater appeared to be especially washed out. A consideration of the photographs published by Alter, convinced me that this effect merited serious attention and that an outflow of gases could occur on the bottom of Alphonsus crater.

The group of the three of craters enumerated, the center one of which is the Alphonsus crater, are located along the meridian and are almost in the center of the lunar disk. The group of these three craters is of ancient origin, but this part of the lunar surface is interesting in that there are a number of meridional breaks here which appeared after the formation of the craters. A break running along the diameter of the crater of Alphonsus and also crevasses and dark spots on the bottom of this crater are interesting. Alphonsus crater has a diameter of about 120 kilometers. The extremely sharp rise of its central peak reaches an altitude of about 1,400 meters over the level of the crater bottom. Located to the north of the crater of Alphonsus, the crater of Ptolomy is a typical large cirque in which there is no central peak. The structure of the bottom and sides of the craters of the given group confirms the high tectonic activity of this part of the lunar surface.

We now consider the problem of how the washed-out effect of the details was obtained with the emanation of gases. It is obvious that a similar faded effect cannot be created by the scattering of light in the escaping gases. For this, a column of gas similar to the Earth's atmosphere, i.e., of about 10^{25} molecules over a square centimeter of surface, would be necessary. But if the gases could fluoresce under the action of the hard solar radiation, then a column of gas capable of absorbing all of the Sun's hard radiation will be sufficient. The coefficient of absorption for the hard, that is, the corpuscular, X-ray, and extreme ultraviolet radiation must be very large. Therefore, it is possible to assume that a column of gas of about 10^{15} molecules, i.e., about 10^{-10} of the Earth's atmosphere, can create a noticeable fluorescence. The formation of such a local atmosphere by the outflow of gases from lunar craters is fully possible. There remains only the problem of whether the intensity of the hard radiation of the Sun is sufficient to create fluorescent radiation in the visible part of the spectrum which can be noticeable on the background of the usual solar spectrum reflected by the Moon. It should be noted that not only gases, but also minerals on the surface of the Moon, can give such fluorescent illumination.

In 1955, the author of the current article obtained a direct indication of the existence of fluorescence in the ray system of the Aristarch crater by the spectral method of comparing the contours of Fraunhofer lines of the solar spectrum and the spectra reflected by the Moon, the intensity of which, in the violet rays, reached about 15 percent of the usual reflected lunar light. This result also showed that it is possible to try to prove the existence of gases emanating from the bottom of lunar craters by the spectral method, according to their fluorescence.

In October and November 1958, together with V. I. Ezersky, an astronomer of the Khar'kov Observatory, I was occupied with the spectral investigation of Mars on the 50-inch reflector in the Crimean Observatory of the Academy of Sciences USSR. In passing, I decided to obtain photometric standard spectograms of certain details of the Moon and, in particular, of the crater of Alphonsus for solving the problem of the possibility of outflowing gases.

During the observations, the spectrograph slit was always inclined according to the right ascension. In the pictures, the linear dispersion consisted of 23 Å per millimeter near H γ, with a scale for the details of about 10 seconds per millimeter. The normal exposure of Kodak 103 AF plates took from 10-30 minutes.

Up to the night of 2-3 November, no peculiarities on the spectrograms of Alphonsus were noticed. In the morning of 3 November, three spectrograms of the crater of Alphonsus were obtained in which the spectrograph slit intersected this crater along a diameter passing through its central peak, as shown in the inset at right. While obtaining the first spectrogram (0400 Moscow time), while sighting the image in the slit, a strong diffusion and an unusual reddish hue of the central peak surprised me. After obtaining this spectrogram, we had to switch to spectrographing Mars according to the program. Therefore, the next spectrogram of Alphonsus was obtained after an interruption lasting from 0600 to 0630. As only the central peak in the crater of Alphonsus appeared in the slit, its unusual brightness and whiteness astonished me. During sighting I did not take my eye from the telescopic sight and at once noted that the brightness of the peak suddenly dropped to normal. Then, the exposure was immediately discontinued and the next one begun, from 0630 to 0640, with the same slit alignment. I did not impart much importance to this visual impression and thought that all of these peculiarities were connected with a change in the quality of the images. Therefore it was somewhat unexpected, that after the development of the spectrograms, all the changes noted visually appeared to be completely true and actually occurred in the central peak of Alphonsus.

In the first spectrogram the central peak was noticeably weakened in the violet rays. This was not observed in the usual spectrograms. A measurement of this picture showed that the absorption changed as λ^{-1} and the calculated total absorption was equal to 15-20 percent of the visible portion of the spectrum.

In the second spectrogram, this absorption was not noted, and the emission spectrum of the gas consisting of a series of wide bands superimposed on the normal spectrum of the central peak (left insert, a) struck the eye.

The third spectrogram showed the usual state of the crater (left insert, b). Thus the phenomenon of the discharging gases lasted not more than 2 1/2 hours and not less than 30 minutes.

The following night, 3-4 November, two more spectrograms of Alphonsus were successfully obtained. These spectrograms showed that the crater continued in its normal state. In the evening of 4 November, the fourth quarter [of the Moon] began, and subsequent observations of Alphonsus were not possible.

Early in the morning of 3 November 1958, a particularly interesting phenomenon occurred in the central peak of the crater of Alphonsus, a volcanic process. At first, dust, volcanic ash, was ejected, and then, as usual, gas was discharged. The escape of gas probably resulted from the rising to the surface of magma containing gases adsorbed in the depths at high pressure.

The most characteristic feature of the emission spectrum of the central peak of Alphonsus is a group of bands beginning from 4754 Å and comparatively sharply outlined from the side of the long waves (left insert, a). The brightness of these bands reaches 40 percent of the normal brightness of the peak in corresponding long waves. It was noted that the superimposed emission shifted slightly toward the Sun. This displacement, consisting of about 0.7 seconds, or about 1.5 kilometers on the lunar surface, probably can be explained by the fact that the hard radiation of the Sun which excited the illumination, could

CPYRGHT

The museum would be situated near Lake Kaali, the largest meteorite crater on the island. It would protect the small craters in the group with light pavilions suitably connected by paths.

Lake Kaali, some 60 meters across, was formed hundreds of years ago by an enormous meteorite striking the ground at an angle of 30-40 degrees. The meteorite's mass was several thousand tons. Falling into the atmosphere, the meteorite, because of the resistance of the air, disintegrated into numerous large pieces. An explosion of collossal force occurred at the point of impact, leaving only very small fragments of the meteorite which were later discovered in diggings in the craters.

Near Lake Kaali are six other smaller cup-shaped depressions one to 5 meters deep and varying from 13-39 meters in diameter. These are the meteorite craters which form the Kaali group.

Magnetometric measurements were recently conducted in craters 3 and 5. Using magnets, 450 grams of fragments of iron meteorite with diameters of more than one millimeter each were recovered from the material filling the craters.

While Lake Kaali is not the only example of meteorite craters in Europe, it is unique in that it is easily accessible. In addition, it belongs to the same type of craters as the Arizona and Texas groups in the US and the Canberra group in Australia. ("Shelters for Cosmic Wanderers," by S. Shchetnin, Moscow, Izvestiya, 8 Apr 59, p 6)

IV. METEOROLOGY

Radio-Controlled Airplane Models Used in Aerological Research

The idea of using radio-controlled airplane models equipped with meteorographs for investigating the lower atmosphere originated with the associates of the CGO (Main Geophysical Observatory imeni A. I. Voyeykov). The GGO, in collaboration with the Leningrad Palace of Pioneers imeni A. A. Zhdanov, began developing special model airplanes and initiated studies on their use for investigating the lower layers of the atmosphere toward the end of 1952. In 1956, the processing of all problems on the use of these models was concentrated in the Department of Physics of the Free Atmosphere, GGO.

The models are high-winged monoplanes using pusher propellors, which eliminates the effect of motor heat on the meteorograph readings. The plane can make timed parachute drops, which are used for wind measurements.

An extremely valuable use of the models is the ability to control their flight directly below, very near the botton of low clouds, and by theodolite observations of the model, it is possible to determine the altitude of low clouds very accurately in a number of points according to time marks and the pressure recordings of the meteorograph. This gives an extremely important integral characteristic of the altitude of the lower boundary of clouds.

The models can operate at heights of over 600 meters. The meteorograph is carried in the nose of the fuselage. It consists of a clockwork-driven drum capable of registering the temperature, pressure, and humidity of the air for a period of one hour.

At present, the model is used only under visual contact conditions. Future plans call for the development of a control station using radar. ("Use of Radio-Controlled Model Airplanes for Aerological Investigations of the Lower Layers of the Atmosphere," by P. A. Vorontsov, V. M. Mikhel', and A. A. Erler; Leningrad, Trudy Glavnoy Geofizicheskoy Observatorii imeni A. I. Voyeykov, No 73, Physics of the Atmosphere, 1958, pp 107-115)

"Flying-Laboratory" Used for Weather Reconnaisance

Twice every 24 hours, a weather reconnaisance plane takes off from Vnukovo airport, near Moscow. Its job is to observe the weather in the upper atmosphere for use in airline operations.

The plane carries 12 aerologists, 6 of whom are women. Beginning at an altitude of 7,000 meters, these technicians observe the cloud structure and make temperature, humidity, and pressure measurements at different altitudes. The plane carries many instruments. These are fastened to the sides of the fuselage and suspended beneath its wings. The data gathered by the "flying-laboratory" are transmitted to the Central Institute of Prognoses and a radio operator reports them to the air meteorological station at Vnukovo. Weather summaries and forecasts are compiled from this information. ("Reconnaisance of the Blue Ocean," by V. Lanina; Moscow, Izvestiya, 1 Apr 59, p 6)

Soviet Review of Chinese Article on Surface Run-Off

The article "Physical-Geographic Factors in the Formation of Surface Run-Off in China," by Kuo Ch'ing-huei which appeared in the Chinese scientific periodical, Acta Geographica Sinica, Vol 24, No 2, May 58, is reviewed in source by N. T. Kuznetsov. Kuznetsov recommends the article be translated in full into the Russian language as it will contribute to a deeper understanding of the general regularities of the change in hydrological elements in China.

The hydrological literature of China up to now was confined mainly to particular hydrological generalizations on separate, usually the eastern, parts of the country. This disjointed stage of investigations is evidently coming to an end, and hydrological information on China has entered a new period, the generalization of laws of changing hydrometeorological elements for the entire territory of the country. From this viewpoint, says Kuznetsov. Kuo's article and its accompanying chart are the first great contribution of a collective of hydrologists in the Institute of Geography, Academia Sinica.

Kuo was very successful in giving a general presentation of the basic laws of change for the mean perennial run-off for the breadth and complexity and the surface features of the country despite the small quantity of hydrological and meteorological data available to him. The map has both perspective and practical value in that it is the hydrological basis for the prospective evaluation of the possibilities of using the water resources of the country.

The map and tables in the article are set up on the basis of problems being developed at present on increasing the water capacity of northern Chinese rivers by means of transferring part of the waters from the southern rivers.

The contents of the five divisions of the article are as follows:

Part I is devoted to the compilation of isolines for the run-off factor, the procedure is explained, and the reasons for such a map of isolines of run-off factor is given.

Part II gives the distribution of surface run-off.

Part III describes the natural factors influencing the formation of surface run-off.

Part IV gives the elements of the water balance of China.

Part V discusses changes in the surface run-off for China which can come about through mans activities. ("Distribution of Surface Run-off of China," review by N. T. Kuznetsov; Moscow, Izvestiya Akademii Nauk SSSR, Seriya Geograficheskaya, No 1, Jan 59, pp 150-152)

V. GRAVIMETRY

Chinese Use Photoregistration Method in Determining Pendulum Periods of Gravimeters

A Russian summary of an article by the Gravimetric Division of the Institute of Geodesy and Cartography, Academy of Sciences China, on a photoregistration method of determining the periods of gravimeter pendulums is as follows.

Associates of the institute, for several years, have continued to apply a synchronization method using a chronometer for time control in determining the periods of pendulums. As a result of irregularities in the speed of the chronometer it was necessary twice to use time signals transmitted by the astronomical observatory to determine the corrections for variations of the chronometer. The time intervals thus obtained, as a rule, had an accuracy of 0.01 seconds. With this accuracy, it was established that in determining a period of up to 0.5×10^{-7} seconds, 24 hours of continuous observation were needed to obtain the results for one interval. Thus, the time necessary for determining a period is relative, but as the nominal relative accuracy of the time signals transmitted by the Siccawei Observatory is of an accuracy up to 1×10^{-8} seconds, it is possible to disregard this error entirely.

The article describes the method of photoregistration which permits the recording of time signals and the movement of the pendulum directly, which cuts the time for an observation to 50 minutes while preserving accuracy in the determination of the period of 0.5×10^{-7}. Experience during the past year showed that the photoregistration method not only curtails observation time, but also simplifies the work. ("Photoregistration Method for Speeding Up Determinations of Pendulum Periods," Gravimetric Division of the Institute of Geodesy and Cartography, Academy of Sciences, China; Peiping, Acta Geodetica et Cartographica Sinica, Vol 3, No 1, 1959, pp 12-18)

VI. LATITUDE AND LONGITUDE

Use of Time Signals for Longitude Determinations in China

An article in a Chinese scientific periodical dealing with longitude determinations issued by the Astronomical Division of the Institute of Geodesy and Cartography, Academia Sinica, has the following summary in Russian.

The increase in the precision of time determinations and the productivity of labor, the lightening of field work to achieve greater effectiveness and less expense of time and energy, all of these are the indispensable way of making astronomical determinations. The current article was written mainly for endeavoring to achieve this aim.

The production of direct time determinations by means of substituting field chronometers with the reception of continuous time signals transmitted by the Time Service makes it possible not only to eliminate the errors arising from keeping time (since the accuracy of clocks Time Service is usually not less than 10^{-8}), but also to eliminate errors in reading time, and it does away with the need for large numbers of chronometers. But most important of all is the fact that in obtaining differences in longitude it is only necessary to add corrections for the speed of travel for radio waves, $\Delta\lambda = u + \Delta S$, to certain fixed corrections for time.

As a result, it is not necessary to protect and move the clocks, thereby making it possible to simplify the calculation process and correspondingly shorten the time of observations. However, in using this method, it was necessary to have continuous time signals and good receivers which would make it possible to receive radio time signals at any given time during the entire process of observations.

("Determination of the Difference in Longitude Directly by Using Continuous Time Signals"; Astronomical Division of the Institute of Geodesy and Cartography, Academy of Sciences China; Peiping, Acta Geodetica et Cartographica Sinica, Vol III, No 1, 1959, pp 7-11)

VII. ARCTIC AND ANTARCTIC

Meteorological Research in Antarctic

Meteorological and aerological research was conducted at all Soviet Antarctic scientific bases in the area of operations of the Third Continental Expedition. In addition, the station "Pole of Inaccessibility" was in operation for a short time.

The data collected at interior stations, together with observations conducted at the south geographic pole, have provided an excellent meridional cross-section of the atmosphere, which is interesting both for synoptical and for climatic research. In addition to regular observations at the stations, the Soviet scientists conducted soundings of the atmosphere with the help of an airplane. This enabled them to explore in a short period of time, the wide expanses above Antarctica and above the surrounding ocean. The latter is especially important for the study of interrelations between the ocean and the glacial continent. Without fully understanding these relations, it is impossible to answer the question as to Antarctica's influence on the climate of the Southern Hemisphere and the circulation of the atmosphere in that hemisphere.

The problem of the general circulation of the atmosphere occupies a very important place among the many scientific subjects under the IGY program. This is fully understandable, since the study of the general circulation promises immediate practical results in the form of improved methods of long-range weather forecasts, for which there is an ever-increasing need.

The Soviet expedition scientists are contributing their share to the study of the circulation of the atmosphere in the Southern Hemisphere. For this purpose, the collection of synoptic data from the radiometeorological centers of the Southern Hemisphere was expanded, and a daily compilation of three synoptic and three aerological charts was organized. K. Vasyukov and A. Babkin, weather forecasters, and Morton Rubin, US scientist, have processed and analyzed this material, and prepared a good foundation for further research on the general circulation of the atmosphere.

In analyzing the cyclonic activity above the Southern Hemisphere during the past year, Ye. Tolstikov, Candidate of Geographic Sciences, came to the conclusion that the cyclonic paths are not dependent on the position of the ice edge to the extent that it had been maintained in literature There are two types of cyclones: (1) deep storm cyclones originating in the temperate zones, which frequently flow in the direction of the Antarctic continent, while carrying warm air with them; and (2) minor low cyclones, connected with the activity of the quasi-Antarctic front. The latter have a tendency to shift in a latitudinal direction and their paths are, to a certain extent, connected with the position of the edge of the ice.

Charts of the recurrence of cyclones, compiled by Ye. Tolstikov, graphically depict the location of the three active zones of the formation of cyclones, which extend in a southeastern direction from South America, South Africa, and Australia.

The general characteristics of atmospheric circulation on a planetary scale are still little known. To solve this problem, the Soviet scientists tried to approach it from different angles. With the help of circulation indexes, A. Babkin made a quantitative evaluation of the zonal and meridional circulation in the Southern Hemisphere for the past year. G. Gruza, a member of the group of meteorologists and aerologists, computed, on the basis of baric topography maps, the kinetic energy of air currents, the intensity of interlatitudinal heat exchange, etc., for every latitude and for the hemisphere as a whole.

The current research on atmospheric circulation would be incomplete without an evaluation of the radiational and turbulent currents of heat over Antarctica, as compared with conditions over t' sea. V. Belov, Candidate of Physicomathematical Sciences, conducted research in the same direction. On the basis of data concerning radiational heating of the air, which were obtained as a result of actinometric observations from the plane and of an approximate evaluation of radiational cooling, he came to the conclusion that even in clear summer weather, the daily radiational heating of the atmosphere above the Antarctic slope is less than the radiational cooling.

Among the special types of observations, one should note the ozonometric studies conducted by B. Shneyerov at the station Oazis, and the observations on atmospheric electricity conducted by T. Lobodin at the Mirnyy observatory.

One of the major projects carried out by the Third Soviet Antarctic Expedition was the study of the topography of East Antarctica. For this purpose, as in many other instances, specially organized flights were used. Profiles of the Antarctic ice sheet were constructed according to ten different flight routes, some of which had a length of 2,000 to 3,000 kilometers. With the use of data obtained during these flights, it will be possible to compile the first hypsometric map of a considerable portion of East Antarctica. This is necessary for a general geographic study of the continent and for seismic soundings of the ice sheet. ("Nature Reveals Its Secrets", Moscow, Vodnyy Transport, 5 Mar 59)

<u>Expeditions to the Arctic and Antarctic</u>

V. V. Frolov, director of the Arctic and Antarctic Institute, told an interviewer about the plans of the institute for 1959.

During this year, it is planned to organize a high-latitude aerial expedition to the Arctic. Its task will be to replace the staffs at the drift stations Severnyy Polyus-6 and Severnyy-Polyus-7. The aerial expedition will also explore the ice cover and will carry out the installation of radio beacons and automatic radiometeorological stations. By the way, one of the radio beacons installed in spring 1958 is still operating.

The station Severnyy Polyus-7 will probably drift further west, along the Canadian archipelago. There is a possibility that its ice floe might be carried out into the Greenland Sea. In that case it would repeat the same route which was taken by the earlier Soviet drift station, Severnyy Polyus-2, and by the US drift station T-3. The ice floe on which Severnyy Polyus-7 is located is strong enough to endure such a drift.

The new staff of the station will consist only of young people. It will be headed by Rogachev, meteorologist, who was a member of the first staff of Severnyy Polyus-7. The polar explorer Antonov, hydrologist, has been appointed chief of station Severnyy Polyus-6.

The Arctic observatories on the hydrological ships Polyarnik and Toros will continue to study the Arctic seas. They will conduct oceanographic surveys of the Bering Strait, the Laptev Sea, the Kara Sea, the East Siberian Sea, and the Chukchee Sea.

Regular ice reconnaissance by plane will be carried out along the Northern Sea Route by experienced hydrologists of Arctic observatories and leading scientists of the institute.

A special airplane, equipped with instruments for observing the temperature, humidity, composition, and structure of clouds, will conduct systematic weather reconnaissance. This flying observatory will supply the Arctic weather bureaus with essential data. ("Expeditions to the Arctic and Antarctic"; Riga, Sovetskaya Latviya, 23 Jan 59)

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